Safety

Digital vs. Analog Two-Way Radios: What Are the Benefits of Going Digital?

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When it comes to choosing a two-way radio, deciding between digital and analog can have significant implications for your workers in terms of safety, range, clarity and functionality. Here are some factors to consider.

A two-way radio can be a life-changing device in your workplace.

An employee could use a radio to alert a co-worker to shut off a machine if there is a potential hazard or to engage a machine guard for safety. Or radio equipment may be used by safety attendants outside confined spaces to maintain contact with workers inside, and in the event of a problem, call for assistance.

When working in potentially hazardous environments, teams must maintain communication to stay on top of tasks, communicate potential risks and ensure everyone understands their responsibilities.

A team of five workers in a noisy and busy facility may be stationed at different locations within the workspace. Using two-way radios, those workers can quickly communicate information, ask important questions and stay focused on their tasks.

> **While battery life is a challenge for all mobile devices, digital technology is much more efficient. Digital radios provide up to 40 percent longer battery life, allowing users to go an entire day without needing a battery recharge.**
> Motorola Solutions

If your company relies on immediate, reliable communication devices to ensure contact between workers, you're no doubt aware that you have a lot of options when it comes to two-way radios.

FCC License: Does Your Radio Require One?

This is an important question for radio owners.

Some radios do not require an FCC license. They are called license-free radios and include the following:

- License-free Motorola Solutions business radios: ***DLR and DTR*** and the ***RMM2050***
- Consumer radios: ***FRS/GMRS*** radios that are used by consumers for activities such as camping, hunting and biking. They are not designed for commercial use.

All the other UHF and VHF radios require an FCC license.

The UHF/VHF business tier radios ***CLS, CLP, RM and RDX*** require an FCC license. These radios are shipped to work out of the box. With the push of a few buttons, the radio can be put into programming mode to change the default frequencies by choosing from a built-in pool of frequencies. Or customers can purchase a programming cable—***HKKN4027***—and download free programming ***software*** to use with their PC to program the radios and other options. Once the radios have been programmed to acceptable frequencies, users can file for an FCC license.

The UHF/VHF commercial tier radios that include both ***digital radios*** and ***analog radios*** cannot be put into programming mode and do not have a built-in pool of frequencies. They are shipped with a test frequency and need to be programmed to the user's frequencies before they are shipped. Hence, for the commercial tier radio portfolio, users need to get licensed if they are using these products for the first time. If they are already licensed or have existing radios, users typically send the seller an existing radio so the seller can read the radio information, copy it into the new equipment, and then store the information for future orders.

ProMarketing Inc. works with ***National License***, a frequency coordinator, to file a user's license with the FCC.

ProMarketing Inc. also works with the end user to gather the user's company information, location and frequency requirements and to submit the application to National License, who, in turn, sends the information to the FCC. The FCC replies to National License with a list of frequencies. If the frequencies are adequate, the company responds to National License and requests they be licensed the frequencies.

Note that an FCC license is granted for 10 years. The process to get the frequencies takes three to four weeks once the application is filed. After the system is installed and operational, a Schedule K needs to be filed to the FCC. This is a notice of construction and the end user has one year to file. If they do not file within one year, the license will be canceled.

You can read more about FCC licensing ***here***.

The emergence of digital two-way radio technology for businesses has had a big impact on the choices

companies make, as the differences between digital and more traditional analog devices can have extensive implications for users, including differences in range, clarity and general functionality.

Read more: Why You Need to Perform Workplace Hazard Assessments

Moving From Analog To Digital Walkie Talkies

Analog radios have been the go-to option for companies looking for reliable and durable voice communications since the 1930s. These devices provide users with an easy-to-use communication system, but they do have limitations when it comes to ensuring clear voice communications or strong reception.

Analog radios tend to highlight all the noises that the microphone picks up, which can make it hard for voices to be understood clearly in noisy environments. Also, radio interference produces static that interrupts signals between analog devices, and voices can become less comprehensible when the devices are used at the outer limits of coverage areas. Another limitation of these radios is that they have limited channel functionality compared with newer digital options.

Enter digital radios. While analog radios were once the longtime standard, digital two-way radios are now becoming more commonplace. These devices offer many advantages over their analog forebears, such as improved voice quality, increased signal coverage, longer battery life and better radio capacity.

And whereas two-way analog radios typically only allow for one two-way conversation at a time per channel, limiting a team's ability to collaborate and conduct private conversations, digital radios expand the capabilities of voice communications, allowing for one-to-one communication and push-to-talk opportunities that improve safety training.

Motorola Solutions *lists four key reasons* why digital radios outperform their analog counterparts.

1. **Better voice quality:** Automatic error correction capabilities maintain voice clarity, even with background noise or a corrupted signal. Speech is digitally encoded, which means advanced algorithms can deliver clear voice in extreme conditions.
2. **Greater capacity:** Bandwidth far outreaches what analog can offer. It's so efficient, it allows you to double the capacity of your existing 12.5kHz channel which can lower your licensing costs.
3. **Stronger coverage:** Digital performs better even at the far edges of coverage. Built-in error correction helps eliminate the static, background noise and voice distortion that can occur with analog radios as you reach the limits of coverage.
4. **Longer battery life:** While battery life is a challenge for all mobile devices, digital technology is much more efficient. Digital radios provide up to 40 percent longer battery life allowing users to go an entire day without needing a battery recharge.

Read more: Eye Protection Guide: Picking the Right Safety Glasses and Goggles

Benefits of Digital Two-Way Radio Systems

In addition to these characteristics, there are other features that make digital an attractive option.

Depending on the radio model you choose, features include preprogrammed text messages, channel voice announcement, one-touch private calling, and "all call"—a powerful feature that allows a user to make an announcement to all team radios at once even if other users are on different channels. This feature enhances team security because in an emergency it allows all radio users to be alerted of an incident with the push of one button.

There are other benefits of switching to digital radios. The investment made in the product can potentially yield greater efficiency for your organization. They may also promote greater safety by reducing the possibility of miscommunications that can come with weak coverage and crossed channels—common problems with analog radios. More safety means ***fewer costly workplace injuries***.

Motorola Solutions is one of the largest manufacturers of two-way radios and a major brand name in the space. The company produced some of the first handheld phones and also developed the first walkie-talkies.

Current Motorola Solutions products include models such as the ***SL300***, the ***CP100d***, the ***CP200d*** and the ***EVX-S24***. These two-way radios are used by businesses engaged in manufacturing, warehousing, construction and commercial activities.

Ultimately, whether your business adopts digital technology depends on its unique needs and requirements. If your business is faring well with analog devices, there's likely no need to upgrade your entire system to digital immediately.

As digital technologies become more commonplace and used by a greater number of organizations, the sophistication of the technology is likely to improve, and costs should come down with greater adoption. Devices may also be customized to perform optimally in an organization and be more useful to your organization's needs.

However, moving to digital could be seen as a smart long-term investment, especially for companies that want to get an edge from high-end functionality.

Are you still using analog radio technology, or have you made the switch to digital? Which do you prefer? Share your insights in the comments below.